

ARTICLE 8: GRADING AND DRAINAGE

Section

- 800 Purpose
- 801 Scope
- 802 Minor modifications
- 803 Permit required, exceptions
- 804 Hazardous conditions
- 805 Permit requirements
- 806 Grading permit limitations and conditions
- 807 Denial of permit
- 808 Grading permit fees
- 809 Bonds
- 810 Grading, inspections, cuts, fills and supervision
- 811 Safety precautions
- 812 Responsibility of permittee
- 813 Modification of approved plans
- 814 Completion of work

§ 800 PURPOSE.

A. The purpose of this article is to provide for the public health, safety and general welfare, and to protect the environment by regulating excavation and grading on property. It also is to reduce siltation into the Unique Waters of Oak Creek and preserve and enhance the natural environment including, but not limited to, the natural land form and vegetation of the city.

B. All excavation and grading shall be performed in accordance with the provisions of this article but shall not be construed to prevent the enforcement of other laws which prescribe more restrictive limitations, nor shall the provisions of this article be presumed to waive any limitations imposed by other statutes or ordinances.

Sedona - Land Development Code

§ 801 SCOPE.

This article sets forth rules to regulate and control earthwork construction, including excavation embankments, grading and drainage on property located within the city; establishes the administrative procedure for issuance of permits and provides for approval of plans, specifications and inspection of such construction.

Grading and Drainage

§ 802 MINOR MODIFICATIONS.

The City Engineer may grant minor modifications to the provisions of this article and amendments relating thereto when there exists an unnecessary hardship substantially limiting the preservation and enjoyment of property rights and resulting from a literal interpretation of this article and amendments relating thereto. Minor modifications shall not be authorized unless it is found that:

A. Special circumstances or conditions apply to this permit application; and

B. Authorizing of the minor modification is necessary for the preservation and enjoyment of substantial property rights; and

C. Authorizing of the minor modification will not be materially detrimental to the persons residing or working in the vicinity, to adjacent property, to the neighborhood or to the public welfare in general; and

D. Granting of the minor modification will be in harmony with the purposes sought to be attained by this article and amendments relating thereto.

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§ 803 PERMIT REQUIRED, EXCEPTIONS.

803.01 Drainage. No person shall obtain a building permit, required by the Building Code of the city, for work in or over any drainageway or floodplain without first complying with this article. No obstruction shall be placed within a drainage facility, roadside ditch, wash, or drainage easement, including but not limited to walls and fences, unless authorized by the City Engineer. In no case shall alteration of any drainageway identified on a USGS topographic map as a permanent or intermittent watercourse be permitted, except as allowed in § 803.02.

A. Submittals for development of individual residential lots within flood-prone areas shall follow, at a minimum, the requirements of the Arizona Department of Water Resources State Standard 6-05 and associated attachments (see Figures 8.1 and 8.2), as they currently exist or may be amended in the future. The Standard, current as of July 2005, is incorporated below with minor formatting and content changes. In the case of a conflict with the requirements of either the City Engineer, Yavapai County Flood Control District, or Coconino County Flood Control District, the more stringent requirement shall apply.

1. ARIZONA DEPARTMENT OF WATER RESOURCES OFFICE OF DAM SAFETY AND FLOOD MITIGATION

State Standard for Development of Individual Residential Lots Within Floodprone Areas

Under authority of A.R.S. § 48-3605 (A), the Director of the Arizona Department of Water Resources establishes the following standard for *Development of Individual Residential Lots Within Floodprone Areas* in Arizona:

a. In addition to providing floodwater surface elevations, floodplain limits and floodway limits for use in fulfilling the requirements of Flood Insurance Studies, local community officials may require the information specified in State Standard Attachment 6-05 (SSA 6-05) or by an alternative procedure reviewed and accepted by the Director. These guidelines shall apply to individual residential lots located in all flood hazard areas identified either by the Federal Emergency Management Agency as part of the National Flood Insurance Program or by the local Floodplain Administrator. Application of these guidelines will not be necessary if the local community or county has in effect a drainage, grading, or stormwater ordinance which, in the opinion of the Department, results in the same or greater level of flood protection as application of these guidelines would ensure.

This requirement is effective May 15, 2005. State Standard 6-05 and State Standard Attachment 6-05 replaces State Standard 6-96 and State Standard Attachment 6-96, adopted in November 1996.

b. Site Plan Checklist. A site plan (plot plan) is required and should be drawn to a scale. See Figures 8.1 and 8.2.

i. All watercourses regulated by state or local agency on the subject lot or within 300 feet of existing or proposed buildings.

ii. Subject lot boundary dimensions with drawing scale and north orientation arrow.

iii. Proposed structure location, including its external dimensions and use.

iv. Any existing structure location, including its external dimensions and use.

v. Adjacent alleys, roads, streets or means of access.

vi. Location of driveway(s) and distance to nearest property line.

vii. Building erosion hazard setback distances measured from nearest top of bank or floodway. The minimum distance must meet the standards outlined in State Standard SS5-96.

viii. Distance(s) from existing and proposed buildings to property line.

ix. Distance(s) between buildings (if applicable).

x. Location of entire septic system (if applicable).

xi. Location of all on-site utility poles, meters (and elevations), lines, etc.

xii. Terrain slope - local drainage flow directions.

xiii. Slope information (may be given in units of feet per foot or percentage of slope).

(A) Indicate high point and low point of subject lot if terrain slopes.

Grading and Drainage

(B) Indicate by arrow or contour the direction of terrain slope.

(C) Indicate difference in elevation between high point and low point of lot.

(D) Field photographs with scale of watercourse.

xiv. All road cuts or fills within 50 feet of the subject parcel, roadside ditches and culverts (including size).

xv. Location and type of walls and fences (and adjacent property), existing and proposed. Details of how the drainage is routed through or around these structures shall be provided when applicable.

xvi. Lowest floor elevation and elevation of lowest enclosed area.

xvii. A minimum of one cross section of the parcel drawn to an appropriate scale. The cross section should include the proposed development residential site. The cross section should include the watercourse.

xviii. Grading limits, include the toe of fill slopes, and proposed changes to existing elevations.

xix. The site plan must include floodplain boundaries. Indicate on which side of the floodplain boundary line the floodplain lies. It must be noted on the site plan if the entire property is located in the floodplain.

xx. Administrative floodplain limits.

xxi. All easements.

xxii. Temporary benchmark.

c. Supplemental Information Checklist. In addition to the information required above, occasionally supplemental information may be required for a site plan. Such information may include but is not necessarily limited to:

i. Topography. If topography is included, the site plan must indicate the vertical datum used, the description of the elevation reference mark, the

date of the topography, and the contour interval (in feet). If the topography is obtained from a public source, that source must be referenced. Topographic contours must be labeled and index contours must be included. Note the use of topography on a site plan may require the certification of a registered professional such as a Registered Land Surveyor, Civil Engineer or Architect. Local and state regulations must be reviewed to determine if certification is necessary.

ii. Water surface elevations. If water surface elevations are included, the source of those elevations must be referenced. The vertical datum must be referenced. If topography is on the site plan, both water surface elevations and the topography must be on the same vertical datum.

iii. Bank protection. Bank protection must be in conformance with State Standard SS7-98.

iv. Location of any proposed underground utilities. If the utility crosses a watercourse the depth of the utility below the watercourse must be indicated.

v. Venting. Details of venting of fully enclosed, non-habitable areas below the regulatory flood elevations designed to equalize hydrostatic flood forces on exterior walls by allowing for the entry and exit of floodwaters in accordance with guidelines of the National Flood Insurance Program Regulations 44 CFR § 60.3. Non-habitable areas below the regulatory flood elevation are to be solely for vehicle parking or storage. This does not include proposed basements, which are not allowed in a floodplain.

vi. Details for the supplemental information listed above may be needed in addition to the site plan.

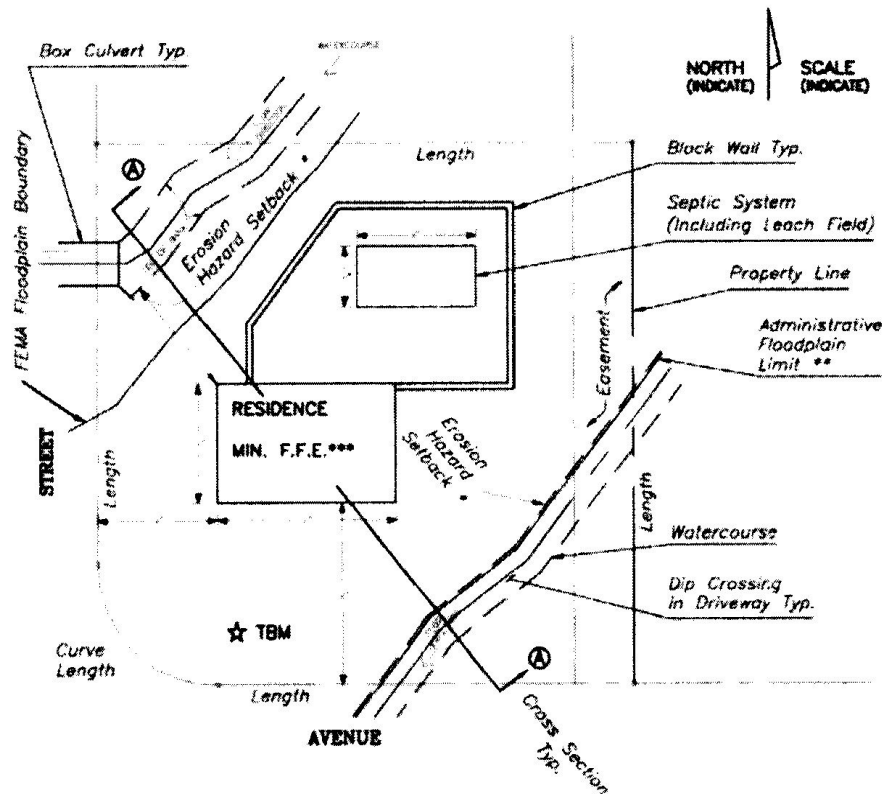
Note: All measurements must be in English Units (i.e., feet).

Figure 8.1

STATE STANDARD 6-05 ATTACHMENT 1

MINIMUM REQUIRED PLOT PLAN FOR DRAINAGE AND FLOODPLAIN INFORMATION

May 2005



* Established by Local Jurisdiction or State Standard 5-96

** If Applicable

*** Finished Floor Elevation Established by Local Jurisdiction

☆ Temporary Benchmark (If Required by Local Jurisdiction)

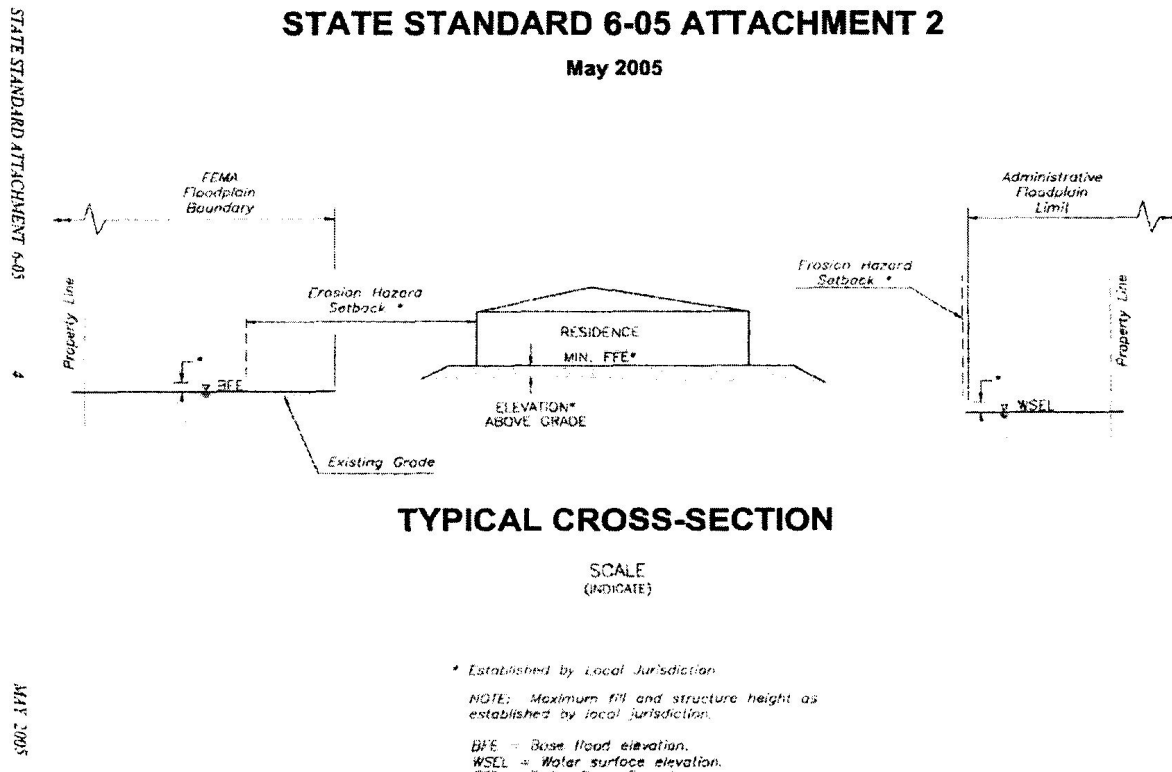
If Supplemental Information is Required by the Local Jurisdiction
it Shall be Shown on the Submitted Plot Plan

LEGEND

- THALWEG
- FLOODPLAIN LIMIT / BOUNDARY
- TOP OF BANK
- PROPERTY LINE (PL)
- ← FLOW FLOW ARROW

Grading and Drainage

Figure 8.2



803.02 Exceptions.

A. Unless otherwise expressly provided herein, this section shall not affect:

1. Existing legal uses of property or the right to continuation of such legal use. However, if a nonconforming use of land or building or structure is discontinued for 12 months, or is destroyed to the extent of 50% of its value, as determined by a competent appraiser, any further use shall comply with this section;

2. Reasonable repair or alteration of property for the purposes for which the property was legally used on September 10, 1991, except that any alteration, addition or repair to a nonconforming building or structure which would result in increasing its flood damage potential shall be either floodproofed or elevated to or above the regulatory flood elevation;

3. Reasonable repair of structures constructed with the written authorization required by A.R.S. § 48-3613;

4. Facilities constructed or installed pursuant to a certificate of environmental compatibility issued pursuant to A.R.S. Title 40, Chapter 2, Article 6.2 (Power Plant and Transmission Line Siting Committee).

B. Written authorization shall not be required, nor shall the city prohibit:

1. The construction of bridges, culverts, dikes and other structures necessary to the construction of public highways, public roads and streets intersecting a watercourse;

2. Any flood control district, county, city or town or other political subdivision from exercising powers granted to it under A.R.S. Title 48, Chapter 21 (Flood Control Districts);

3. The construction of streams, waterways, lakes and other auxiliary facilities in conjunction with the development of public parks and recreation facilities by a federal or state public agency or a political subdivision of the State of Arizona.

Sedona - Land Development Code

C. Before any construction authorized by this subsection may begin, construction plans shall be approved by the City Engineer and County Flood Control District.

D. These exceptions do not preclude any person from liability if that person's actions increase flood hazards to any other person or property. Neither the issuance of a building permit under the provisions of this article, nor compliance with the provisions hereof, or with any conditions imposed in the building permit, shall relieve any person from responsibility for damage to other persons or property, nor impose any liability upon the city for damage to other persons or property.

803.03 Filling and Excavation.

A. No person shall do any grading, filling, excavating, cutting or other site earthwork without first submitting plans; drawings; engineering studies; supporting data, including the quantity of cut and the quantity of fill; and such other information as required by the City Engineer and Director. The information and documentation shall clearly indicate the extent and nature of the work proposed, and the location of temporary construction envelope fences required to be erected in conformance with the provisions of § 812.04. The City Engineer shall approve all submitted documentation before a permit may be issued by the Director, except where a building permit may be issued and a grading permit is not required.

B. A permit issued for grading, filling, excavating, cutting or other site earthwork shall comply with the requirements of this article.

C. The issuance of a grading permit shall occur only after a building permit for all physical improvements associated with single-phased projects or for the first phase of multi-phased projects has been issued by the Director in accordance with applicable city standards. Complete development and site plan approval on proposed projects in their entirety shall be required. Construction of a single-family dwelling involving cumulatively less than 1,000 cubic yards of grading, as defined as the sum of cut and fill relative to original contours, shall be exempt from the provisions of § 803.03A.

D. Upon issuance of a grading permit, all earthwork shall be commenced and diligently pursued.

E. The following activities may be authorized by the City Engineer without formal issuance of a grading permit but otherwise must be fully in accordance with this article.

1. Compacted or contained fill less than 1 foot in depth and placed on natural terrain with a slope flatter than 5 horizontal to 1 vertical or less than 3 feet in depth, not intended to support structures and which in either case, the fill shall not exceed 50 cubic yards on any 1 site and, in either case, shall not obstruct a drainage course.

2. An excavation below finished grade for basements and footings of a building, retaining wall or other structure authorized by a valid building permit. This shall not exempt any fill made with the material from such excavation nor exempt such an excavation having an unsupported height greater than 5 feet after the completion of such structure.

3. Excavation or depositing of earth materials within a property which is dedicated or used, or to be used for cemetery purposes not obstructing a watercourse, except where such grading is within 100 feet of the property line or intended to support structures.

4. Mining, quarrying, excavating, processing, stockpiling of rock, sand, gravel, aggregate or clay where established and provided for by law, provided that such operations do not:

- a. Affect the lateral support;
- b. Unduly increase the stresses in or pressures upon any adjacent or contiguous property;
- c. Do not physically infringe on adjacent property;
- d. Include detrimental excavation or stockpiling;
- e. Result in degradation of scenic views.

5. Grading in public rights-of-way and easements done under a permit issued by the office of the City Engineer.

6. Sanitary landfills and refuse disposal areas which are regulated by the Coconino and Yavapai County Health Departments.

7. Excavations performed in drilling a water supply well.

8. An excavation which does not exceed 50 cubic yards, does not obstruct a drainage course, and:

Grading and Drainage

a. Is less than 2 feet in depth; or

b. Which does not create a cut slope greater than 5 feet in height and steeper than 2 horizontal to 1 vertical.

F. At least 5 city working days prior to the placement of fill or excavated material from a grading project within the city on other properties located within the city, the City Public Works Department shall be notified in writing of the intent to place the material on other property. This requirement shall apply when the total amount of material placed on other properties within the city exceeds 40 cubic yards or if the other property on which the fill is to be placed is located within 0.75 miles of Oak Creek, or lies within a city designated flood plain. Pursuant to the provisions of this code and other city, state, or federal regulations, the City Engineer may approve or deny permission to place such material. This requirement shall apply to all grading within the city, whether a specific permit is issued or not.

(Am. Ord. 2006-02, passed 1-10-2006; Am. Ord. 2009-15, passed 10-13-2009)

Sedona - Land Development Code

§ 804 HAZARDOUS CONDITIONS.

Whenever the Director or the City Engineer determines that any existing excavation or embankment or fill has become a hazard to life and limb, or endangers property, or adversely affects the safety, use or stability of a public way or drainageway, such condition shall be deemed a nuisance and the owner of the property upon which the excavation or fill is located, or other person or agent in control of said property, upon receipt of notice in writing from the City Engineer shall, within the period specified, therein repair or eliminate such excavation or embankment so as to eliminate the hazard and be in conformance with the requirements of this article.

Grading and Drainage

§ 805 PERMIT REQUIREMENTS.

Except as provided in § 803 of this article, no person shall commence grading without first obtaining a building permit and a grading permit from the Department of Community Development. A separate grading permit shall be required for each site, and may cover both excavation and fills.

805.01 Plans and Specifications. When required by the City Engineer, each application for a grading permit shall be accompanied by 2 sets of plans and specifications and may require supporting data consisting of a soil engineering report and engineering geology report as determined by the City Engineer. Plans and specifications shall be prepared and signed by a Civil Engineer, as defined in Article 2, when required by the City Engineer.

805.02 Information of Plans and Specifications. Plans shall be drawn to scale and supplemented with a bar-graph to preclude changes via enlargements or reductions upon substantial paper or mylar, and in addition may be stored on computer diskettes as specified by the City Engineer, and shall be of sufficient clarity to indicate the nature and extent of the work proposed, and show in detail that they will conform to the provisions of this article and all relevant laws, codes, rules and regulations. The first sheet of each set of plans shall give the location of the work, the name and address of the property owner, and the person by whom they were prepared. Plans that are excessively smudged or poorly printed or drawn shall not be accepted by the City Engineer. The plans shall include the following information:

A. Specific location, assessor tax parcel number(s) and zoning district classification;

B. Property limits and accurate contours at 2-foot intervals of existing ground and details of terrain and area drainage with a north indicating arrow;

C. Limiting dimensions, elevations of finish contours to be achieved by the grading and proposed drainage channels and related construction;

D. Detailed plans of all surface and subsurface drainage devices, walls, cribbing, dams and other protective devices to be constructed with, or as a part of, the proposed work together with a map showing the drainage area and the estimated runoff of the area served by any drains;

E. Location of any buildings or structures on the property where the work is to be performed and the

location of any buildings or structures on land of adjacent property owners which are within 15 feet of the property or which may be affected by the proposed grading operation;

F. Location and specification of temporary traffic and parking surfaces complying with the dust control requirements of § 806.01E.1.;

G. A schedule of work, including:

1. When grading will begin;
2. When temporary erosion control and vegetation protection will occur;
3. When initial grading will be completed;
4. When all construction slash, debris and vegetation remains will be removed to a specified authorized site;
5. When permanent erosion control devices will be installed;
6. When revegetation will occur;
7. When construction of all grading is to be completed;
8. Such additional information as the Director may require to monitor the schedule.
9. Specifications shall contain information covering construction and materials requirements.

805.03 Soil Engineering Report. The soil engineering report when required by § 805.01 shall include data regarding the nature, distribution and strength of existing soils, conclusions and recommendations for grading procedures and design criteria for corrective measures including buttress fills when necessary, and opinions and recommendations, covering adequacy of sites to be developed by the proposed grading, including stability of slopes. Recommendations included in this report and approved by the City Engineer shall be incorporated in the grading plans or specifications.

805.04 Engineering Geology Report. The engineering geology report when required by § 805.01 shall include an adequate description of the geology of the site, conclusions and recommendations regarding the effect of geologic conditions on the proposed development, and

Sedona - Land Development Code

opinions and recommendations covering the adequacy of sites to be developed by the proposed grading. Recommendations included in this report and approved by the City Engineer shall be incorporated in the grading plans or specifications.

805.05 Modification. The Director may require grading operations and project designs be modified if weather-generated problems occur that were not considered at the time the grading permit was issued.

805.06 Drainage Design and Treatment.

All developments shall be designed with considerations for existing, temporary, and post development drainage impacts and flows. These considerations shall include quantity, quality, and method of delivery of drainage flows. Since some portion of the city lies within the Yavapai County Flood Control District or the Coconino County Flood Control District these agencies shall be consulted when altering natural drainages or constructing within 100-year flood plains and floodways.

A. General. Drainage design within the City of Sedona shall comply with the Drainage Criteria for the City of Sedona as shown in Table 8.1. The method of design of drainage facilities shall be as provided in the City of Sedona Storm Drainage Master Plan dated March 2005, prepared by Dibble & Associates, and accepted by the City Council. Flows used in design shall be similar to the flows identified in that document. Exceptions must have the written approval of the City Engineer.

B. Natural Drainage System Alteration.

1. In addition to complying with Section A above, improvements of existing natural drainage systems shall meet the requirements of the Yavapai County Flood Control District Flood Damage Prevention Ordinance, as applicable. The applicant must submit a copy of Yavapai County Flood Control District's Development Permit to the City Engineer prior to issuance of a grading permit for projects located within Yavapai County. The City Engineer may determine it is necessary to reinforce the stability of such drainage where there are signs of erosion or where the proposed development may add water runoff greater than current levels.

2. Replacement of Existing Facilities. When replacing an existing storm drainage facility the design flow may be utilized for analysis per Table 8.1.

However, the 100-year flow must be checked to insure the floodplain has not been increased in width or elevation. The replacement shall not result in increased flood for the design or 100-year storm.

3. Pollution Control. Project designs shall include best management practices to prevent storm water pollution during and after construction of the project. The practices shall be subject to the approval of the City Engineer. These practices may include procedures, as well as installation of facilities, or a combination. Proper state and federal permits shall be obtained prior to starting grading. The applicant shall state on the grading permit or building permit application whether or not the project requires or is subject to a state stormwater pollution prevention permit.

C. Shape. New drainage or relocated drainage shall be designed with slope rounding to blend with natural contours. New or relocated drainage shall be designed to comport with the natural terrain. In most cases, this shall mean a curvilinear water course. New or relocated drainage shall be designed to vary in width or depth similar to natural drainages.

D. Runoff Control. Project designs shall to the extent practicable provide drainage measures on the project site so that off-site storm drainage flows do not increase, are not more polluted, or differently delivered than existing flows, unless adequate provisions are made to accommodate the flow off site. Measures shall be designed to preclude non-storm drainage flows from flowing between or off of properties.

E. Easements. Adequate easements shall be provided for storm drainage facilities. Easement sizes shall be as per the Drainage Criteria in Table 8.1. If a facility is to be located within a public right-of-way the edge of the facility shall be located at least 6 feet from the edge of the right of way. The City Engineer may approve exceptions to this requirement, if adequate area for city maintenance of the drainage facility will exist, in the City Engineer's judgment.

F. Vehicular and Pedestrian Crossings. Design of low water crossings for vehicles and pedestrians shall not be allowed, unless a non-low water crossing route approved by the Fire Department as an acceptable access is provided from the development. Exceptions to this requirement must be approved by the City Engineer and the Fire Chief for the area in which the development is located.

Grading and Drainage

G. 1. Precipitation data shall be per Tables 8.2 and 8.3. The mean precipitation frequency estimates provided in Table 8.2 may be used for design storm frequencies up to the 10-year storm. The upper limit precipitation frequency estimates provided in Table 8.3 shall be used for design storm frequencies greater than the 10-year storm.

2. These precipitation frequency estimates were obtained from the NOAA Atlas 14. Data was retrieved for the Sedona Ranger Station in Sedona, Arizona (longitude (dd) -111.7667, latitude (dd) 34.8667, elevation (feet) 4,232).

Sedona - Land Development Code

Table 8.1

Drainage Criteria City of Sedona			
No.	Stormwater Components	Design Items	City of Sedona
1.0	Street and Pavement Drainage	Storm Frequency:	2-yr. 100-yr.
		Allowable Spread:	
		Local Streets	1-12 foot lane clear within ROW
		Collector Streets	1-12 foot lane clear within ROW
		Arterial Streets	open each way within ROW
		Minimum Street Slopes:	
		Longitudinal	0.50% (curbed and rural streets) with 1% minimum transverse slope
2.0	Storm Drains	Storm Frequency:	2-yr. DA < 160 acres
			10-yr. DA > 160 acres
		Minimum Pipe Size:	
		Main Line	24 in.
		Other	18 in.
		Minimum Velocity:	
		Desirable	5 fps.
		Absolute	3 fps.
		Max. Manhole Spacing:	
		Small Pipe:	D < 30 in. 300 ft.
		Medium Pipe:	30 in. ≤ D ≤ 45 in. 400 ft.
		Large Pipe:	D ≥ 45 in. 500 ft.
		Drainage Easement:	
		Small Pipe:	D ≤ 36 in. 16 ft.
		Large Pipe:	D > 36 in. D + 16 ft.

City of Sedona Storm Water Master Plan

Grading and Drainage

Drainage Criteria City of Sedona			
No.	Stormwater Components	Design Items	City of Sedona
3.0	Culverts	Storm Frequency:	25-yr. (roadway cross.) 100-yr. (roadway cross.)
			2-yr. (roadside ditches) ≤ 160 acres
			10-yr. (roadside ditches) ≥ 160 acres
		Overtopping Limit:	no overtopping (25-yr.) 12-in. max. (100-yr.)
		Secondary access	
		D.A. > 1/4 sq. mi.	
		Maximum HW/D Ratio:	1.5
		Minimum Pipe Size:	
		Roadways	24 in.
		Driveways	15 in.
		Velocity Limits:	
		Minimum	3.0 fps.
		Maximum	
4.0	Open Channels	Storm Frequency:	25-yr. 100-yr. (check)
		Froude No.	$FN \leq 0.86$; $1.13 \leq FN \leq 2.0$
		Freeboard (Minimum):	
		Subcritical Flow	$FB = 0.25*[y + (v^2/2g)]$ (1-ft. min.)
		Supercritical Flow	$FB = 0.25*[y + (v^2/2g)]$ (2-ft. min.)
		Maintenance Road:	12 ft. wide, one side of channel
		Maximum Velocity:	per channel lining material
		Maximum Side Slope:	(ss = from slope stability analysis)
		Vegetal/Earth	3:1 or ss
		Loose Riprap	3:1 or ss
		Rigid Lining	ss
		Shotcrete	1:1
		Soil Cement	1:1
		Building Setback from Channel Bank and Floodway:	1.5 x the channel depth, unless otherwise approved by the City Engineer for engineering reasons. However, in any case, the more restrictive requirements within Article 8 shall apply.

Sedona - Land Development Code

Drainage Criteria City of Sedona			
No.	Stormwater Components	Design Items	City of Sedona (Proposed)
5.0	Stormwater Storage	Storm Frequency:	2-, 10-, 25-, and 100-yr. storms
		Criteria:	post-proj. $Q \leq$ pre-proj. Q
		When Required:	1 acre or larger development or when post-development flow will exceed pre-development flow by ≥ 1 cfs.
		Maintenance Road:	12 ft. access road
		Maximum Depth:	
		Parking Areas	
		Emergency Spillway	pass post-developed 100-yr. Q
		Maximum Drain Time:	12 hrs. upstream watershed areas ≤ 10 ac. and 24 hrs. for an upstream watershed area > 10 ac.
		Freeboard (Minimum):	1 ft. (post developed 100-yr. event)
		Min. Principal Outlet:	12 inch
		Maximum Side Slopes	
		Depth < 3 ft.	2:1, protected; 3:1, unprotected
		Depth ≥ 3 ft.	4:1

City of Sedona Storm Water Master Plan

Grading and Drainage

Table 8.2

<i>Mean Precipitation Frequency Estimates</i>															
Freq (yr)	5-min	10-min	15-min	30-min	60-min	120-min	3-hr	6-hr	12-hr	24-hr	2-day	4-day	7-day	10-day	20-day
1	0.21	0.33	0.40	0.54	0.67	0.80	0.86	1.05	1.34	1.72	2.02	2.33	2.74	3.13	4.06
2	0.28	0.42	0.52	0.70	0.86	1.01	1.08	1.30	1.66	2.14	2.52	2.91	3.41	3.88	5.03
5	0.37	0.56	0.70	0.94	1.16	1.33	1.39	1.61	2.03	2.66	3.14	3.65	4.23	4.79	6.11
10	0.45	0.68	0.85	1.14	1.41	1.60	1.65	1.89	2.33	3.08	3.64	4.25	4.91	5.51	6.92
25	0.56	0.85	1.06	1.43	1.77	1.99	2.03	2.28	2.75	3.67	4.33	5.10	5.86	6.48	7.97
50	0.66	1.00	1.24	1.67	2.06	2.31	2.35	2.60	3.07	4.13	4.87	5.78	6.62	7.23	8.75
100	0.76	1.15	1.43	1.93	2.38	2.67	2.71	2.96	3.41	4.61	5.44	6.50	7.41	8.00	9.51
200	0.87	1.32	1.64	2.20	2.73	3.06	3.10	3.32	3.75	5.10	6.03	7.25	8.24	8.78	10.24
500	1.03	1.56	1.94	2.61	3.23	3.63	3.66	3.87	4.22	5.76	6.83	8.30	9.38	9.82	11.18
1,000	1.16	1.77	2.19	2.95	3.65	4.10	4.13	4.31	4.60	6.30	7.46	9.13	10.29	10.61	11.86

Table 8.3

<i>Upper Limit Precipitation Frequency Estimates</i>															
Freq (yr)	5-min	10-min	15-min	30-min	60-min	120-min	3-hr	6-hr	12-hr	24-hr	2-day	4-day	7-day	10-day	20-day
1	0.26	0.39	0.48	0.65	0.80	0.93	0.99	1.16	1.49	1.88	2.23	2.57	3.00	3.43	4.43
2	0.33	0.50	0.62	0.83	1.03	1.18	1.26	1.44	1.84	2.36	2.79	3.21	3.75	4.27	5.50
5	0.44	0.67	0.83	1.12	1.39	1.55	1.60	1.79	2.24	2.94	3.47	4.02	4.64	5.26	6.68
10	0.54	0.82	1.01	1.36	1.69	1.87	1.91	2.10	2.57	3.41	4.01	4.68	5.39	6.05	7.56
25	0.67	1.02	1.26	1.70	2.10	2.31	2.34	2.54	3.03	4.05	4.77	5.60	6.43	7.10	8.70
50	0.78	1.19	1.47	1.98	2.46	2.69	2.71	2.89	3.38	4.55	5.36	6.34	7.27	7.94	9.56
100	0.90	1.37	1.70	2.29	2.84	3.12	3.14	3.29	3.76	5.08	5.99	7.14	8.16	8.80	10.40
200	1.03	1.57	1.95	2.63	3.25	3.57	3.59	3.72	4.14	5.63	6.66	7.97	9.06	9.66	11.21
500	1.23	1.88	2.33	3.12	3.88	4.24	4.27	4.37	4.70	6.40	7.56	9.18	10.37	10.84	12.26
1,000	1.40	2.13	2.65	3.56	4.41	4.79	4.85	4.90	5.15	7.02	8.28	10.15	11.39	11.74	13.05

(Am. Ord. 2006-02, passed 1-10-2006; Am. Ord. 2009-15, passed 10-13-2009)

Sedona - Land Development Code

§ 806 GRADING PERMIT LIMITATIONS AND CONDITIONS.

806.01 General.

A. 1. The issuance of a grading permit shall constitute an authorization to do only that work which is described or illustrated on the application for the permit or on the site plans and specifications approved by the City Engineer.

2. The issuance of a permit or the approval of drawings and specifications shall not be construed to be a permit for, nor the approval of, any violation of or deviation from the provisions of this article or any other ordinance, code, law, rule or regulation. A permit issued shall be invalid if, in the work completed, a violation of this article or deviation therefrom ensued. When such violation occurs, the permit shall be deemed to be canceled and the ground shall be restored to the condition it was in prior to start of the grading work.

3. The issuance of a permit, based upon drawings and specifications, shall not prevent the City Engineer or the Director from thereafter requiring the correction of errors in said drawings and specifications or from stopping unlawful construction operations being carried on thereunder.

B. Jurisdiction of other agencies. Permits issued under the requirements of this article shall not relieve the owner of responsibility for securing required permits for work to be done which is regulated by any other ordinance, department or division of the city or other governing agency including but not limited to the Army Corps of Engineers. A grading permit shall not be issued until all required permits are obtained from the Arizona Department of Environmental Quality, the County Health Departments, the County Flood Control District and other agencies of jurisdiction. For commercial projects, a city right-of-way permit shall be required for all work performed within city rights-of-way. For detached single-family residential permits, the grading permit shall be sufficient for all work confined within the property lines, and typical driveway connections to the street, and associated landscaping and drainage devices. Every attempt shall be made to do no work, or store no materials within city rights-of-way (i.e. porta-potties, dumpsters, construction materials, etc.). In the event that this is not possible, a right-of-way permit shall be secured prior to working within, or placing anything within, the right-of-way. In the event that unloading of materials or equipment onto the site from the right-of-way takes place, proper traffic control methods, including flagmen, shall be provided at all times. Extensive street blockages require a right-of-way permit.

C. Time limits. The permittee shall fully perform and complete all of the work required to be done pursuant to the grading permit within the time limit specified. If no time limit is specified, the permittee shall complete the work within 180 days after the date of the issuance of the grading permit. If the permittee is unable to complete the work within the specified time, he shall, prior to the expiration of the permit, present in writing to the Director a request for an extension of time, setting forth the reasons for the requested extension. If, in the opinion of the Director, such an extension is warranted, he may grant additional time for the completion of the work.

D. Storm drainage precautions. All persons performing any grading operations shall put into effect all safety precautions which are necessary in the opinion of the City Engineer and provide adequate anti-erosion and/or drainage devices, debris basins or other safety devices to protect the life, limb, health, property and welfare and private and public property of others from damage of any kind, and to be fully in accord with all ordinances, policies and procedures of the Yavapai County Flood Control District, pursuant to § 805.06 of this article.

E. Dust control requirements. All persons performing any grading, site clearing, grubbing, trenching, drilling, blasting or soil screening shall put into effect dust prevention measures deemed necessary by the City Engineer to mitigate the generation of excessive airborne dust by such operations and/or related construction activity. The required dust prevention measures shall be maintained during the entire period of construction and until such time as the project is completed and receives final inspection approval of the City Engineer. The minimum requirements for dust control on each site, whether or not a formal grading permit is issued, are as follows:

1. All vehicular traffic and parking shall be restricted to existing paved driveways and parking areas where available or to temporary driveways and parking areas surfaced with clean rock, gravel or other pre-approved materials in a manner acceptable to the City Engineer. Temporary surfacings shall be adequately compacted to support the anticipated wheel loads and re-surfaced or re-treated as necessary to maintain a dust free area to the satisfaction of the City Engineer. For projects other than a detached dwelling on a single site, when plans are required to be submitted pursuant to § 805.01, plans indicating the location, material, installation and maintenance of temporary driveways and parking areas shall accompany each permit application. The traffic surfacing must be applied prior to putting the traffic surface into service. For a single detached dwelling on a site, temporary traffic surfacing must be applied prior to putting the traffic

Grading and Drainage

surface into service. The type of temporary traffic surfacing shall be specified on the grading plans, and may include no less than 2" thickness of 3/4" aggregate, 1" asphalt pavement, or other approved surfacing. The surface shall be adequate to reduce tracking and blowing dust. At no time shall vehicles or construction equipment be allowed to park on or travel across adjacent lots or parcels without first obtaining written permission of the appropriate property owner. Approved use of adjacent properties for parking of vehicles, construction equipment and storage of materials shall comply with the requirements of this section and shall be re-vegetated after the completion of construction pursuant to § 810.07E.;

2. When weather and soil conditions are such that excessive airborne dust may be generated by construction equipment, loading or unloading of construction materials, grading, site clearing, grubbing, trenching or soil screening operations on any site, water sprinkling or other suitable methods shall be employed to limit the amount of airborne dust and dirt to the lowest practicable level as determined by the City Engineer;

3. All exposed excavations, fill material, stockpiled soil and rock, and trench soil on all sites shall be treated with water, a dust palliative or other pre-approved materials and methods that will act as a binder for soil particles and reduce the amount of free, loose dust on the exposed surfaces. Treatment shall be initiated as soon as possible after excavations are exposed and fill or spoil materials are deposited. Treatment shall be continued and maintained through all phases of construction to the satisfaction of the City Engineer;

4. When conditions are such that vehicles or equipment leaving any construction site may track or deposit mud, dirt, or other debris on public rights-of-way within the city, the contractor shall take all reasonable practicable steps to prevent such tracking or deposit of said materials. In the event such materials are tracked or deposited on public or private rights-of-way as a result of vehicles or equipment leaving any construction site, it is the responsibility of the contractor to remove these materials from such rights-of-way with all reasonable speed and diligence. Methods used to achieve this will be such that no mud, dirt, silt, or debris, shall enter the storm drain system. If mechanical sweepers are utilized, sweepers shall be of the vacuum type. The bulk of the material shall be removed by other methods prior to sweeping. Safety precautions and traffic control shall be provided at all times.

806.02 Conditions of Approval. In granting any permit under this article, the Director or City Engineer may attach such conditions as may be reasonably necessary to

prevent creation of a nuisance or hazard to public or private property. Such conditions may include, but shall not be limited to:

A. Best Management Practices (BMP's), the criteria for which shall be determined by the City Engineer, shall be incorporated at all times for all dust control, runoff water quality, and erosion control measures. These measures shall be incorporated into both the temporary and finished aspects of the project. Schedules and criteria for maintenance of both the temporary and permanent BMPs incorporated into the project shall be identified on the grading plans.

B. Compliance with dust control requirements of this Code, other city ordinances, the Coconino and Yavapai County Health Departments and the State Department of Environmental Quality. Vehicles carrying loads shall have them covered with a secure tarpaulin or other covering to prevent the load from spilling or blowing from the vehicle. All loads and loose material subject to dropping from vehicles, being sifted from vehicles or otherwise escaping from vehicles shall be covered when traveling on a public street or highway within the City of Sedona. Water sprinkling, dust palliatives, or other suitable methods shall be employed at all times to limit the amount of airborne dust and dirt to the lowest practicable level as determined by the City Engineer, and to prevent airborne dust particles from migrating off-site. Excavation and grading shall be halted when conditions render mitigation methods ineffective. Methods to prevent tracking of dirt and other materials from the construction site onto public streets or highways within the City of Sedona shall be incorporated at all times. Removal of tracked, dropped, sifted or otherwise deposited material on public streets and highways within the City of Sedona shall occur daily, or as deemed necessary by the City Engineer, to avoid the occurrence of dust, excessive mud, hazard, or nuisance to the public using the roadway. "Public using" the roadway includes vehicles and pedestrians. Water or other substances may be sprinkled on the roadway for the purpose of cleaning or maintaining the roadway.

C. Right-of-way permit requirements. Every attempt shall be made to do no work, or store no materials within city rights-of-way (i.e. porta-potties, dumpsters, construction materials, etc.). In the event that this is not possible, a right-of-way permit shall be secured prior to working within, or placing anything within, the right-of-way. In the event that unloading of materials or equipment onto the site from the right-of-way takes place, proper traffic control methods, including flagmen, shall be provided at all times. Extensive street blockages require a right-of-way permit.

Sedona - Land Development Code

D. Requirements for fencing of excavations or fills which would otherwise be hazardous;

E. Improvement of any existing site condition to bring it up to standards of this chapter;

F. Grubbing and tree removal requirements. All tree material and other vegetation cut or grubbed from the site shall immediately be placed in a dumpster or dump truck, then removed from the site and properly disposed of, outside the city limits, within 48 hours;

G. Requirements for silt and erosion control. Measures shall be employed at all times to prevent erosion and the entrance of material into the storm drainage system. Provisions shall be made to trap and remove material entering the storm drainage system. The storm drainage system includes all gutters, ditches, pipes and channels. Flushing and cleaning of concrete trucks, mixers, etc., shall not be done in such a manner as to allow the migration of water or material off-site;

H. Requirements to protect the sewer system. All portions of, including main lines, laterals, and cleanouts, shall be capped or otherwise protected at all times to prevent foreign objects and debris from entering the City of Sedona sewer system. Active lines should be protected at all times from breakage and disturbance in order to prevent spills.

I. For projects involving grading of more than 5,000 cubic yards, a haul plan, a dust control plan, a topsoil reutilization plan, a stormwater pollution prevention plan, and a traffic control plan shall be required. Each must be acceptable to and approved by the City Engineer;

J. Hours of work shall be 7:00 a.m. to 6:00 p.m., Monday through Friday. Work hours are 9:00 a.m. to 5:00 p.m. on Saturday. No work shall occur on Sunday.

806.03 Liability. Neither the issuance of a permit under the provisions of this article nor the compliance with the provisions hereof, or with any conditions imposed in the permit issued hereunder, shall relieve any person from responsibility for damage to other persons or property, nor impose any liability upon the city for damage to other persons or property.

806.04 Revocation. Should the City Engineer or the Director find the work under any permit issued under these provisions is not proceeding in accordance with the

drawings, specifications and details of the application upon which such permit was issued, or is proceeding in violation of this article or any other ordinance of the city, or should he find that there has been any false statement or misrepresentation as to a material fact in the application or payment for said permit or plans on which the permit was based, the Director shall notify the person obtaining the permit and the owner that such work fails to conform to said permit, or that the permit was obtained by false representations and that such failure in obtaining the permit be corrected without delay. If the owner or person obtaining the permit fails or refuses to make such correction within the time specified in said notice, the Director shall revoke such permit and serve notice of such revocation upon such person to whom the permit was issued. Such notice shall be in writing and signed by the Director. It is unlawful for any person to proceed with any part of such work after such notice is served. When necessary, law enforcement personnel shall be employed to insure compliance.

806.05 Grading in accordance with ITE guidelines. All grading for streets and driveways shall be in accordance with the recommendations and guidelines specified by the Institute of Transportation Engineers (ITE) in the following documents: *Guidelines for Driveway Location and Design, ITE Publication No. RP-006B (1987); Guidelines for Urban Major Street Design - A Recommended Practice, ITE Publication No. RP-010A (1984); Recommended Guidelines for Subdivision Streets - A Recommended Practice, ITE Publication No. RP-011C (1993).*

(Am. Ord. 2006-02, passed 1-10-2006; Am. Ord. 2009-15, passed 10-13-2009)

Grading and Drainage

§ 807 DENIAL OF PERMIT.

807.01 Geological or Flood Hazard. If, in the opinion of the City Engineer, the land area for which grading is proposed is subject to geological or flood hazard to the extent that the proposed corrective work will not eliminate or sufficiently reduce the hazard to human life or property, the grading permit and the building permits for habitable structures shall be denied.

807.02 Unlawful Grading. The Director shall not issue a permit in any case where he finds that the work as proposed by the applicant will endanger any private property or result in the depositing of debris or soils on any public way or seriously interfere with any existing drainage course. However, if it can be shown to the satisfaction of the City Engineer that the hazard would be essentially eliminated by the construction of retaining structures, buttress fills, drainage devices or by other means, the Director may issue the permit.

Sedona - Land Development Code

Grading and Drainage

§ 808 GRADING PERMIT FEES.

Before issuance of a permit, the Director shall collect the fees set forth in Tables 808.01 and 808.02. Such fees shall be paid in lawful money of the United States or by collectable draft or check. Should such draft or check be uncollectible within 15 days, the permit shall be null and void.

808.01 Plan-Checking Fee. For excavation and fill on the same site, the fee shall be based on the volume of the excavation or fill, whichever is greater. Before accepting a set of plans and specifications for checking, the Director shall collect the plan-checking fee. Separate permits and fees shall apply to retaining walls or major drainage structures as stated elsewhere in this article. There shall be no separate fee for standard terrace drains and similar facilities as determined by the Director. The amount of the plan-checking fee for grading plans shall be set forth in Table 808.01.

808.02 Grading Permit Fees. A fee for each grading permit shall be paid to the Director as set forth in Table 808.02. For excavation and fill on the same site, the fee shall be based on the volume of the excavation or fill, whichever is greater.

**TABLE 808.01:
PLAN CHECKING FEE SCHEDULE**

25 cubic yards or less	No fee
26 to 100 cubic yards	\$10
101 to 1000 cubic yards	\$15
1001 to 10,000 cubic yards	\$20
10,001 to 100,000 cubic yards	\$20 for the first 10,000 cubic yards plus \$10 for each additional 10,000 cubic yards or fraction thereof
100,001 to 200,000 cubic yards	\$110 for the first 10,000 cubic yards plus \$6 for each additional 10,000 cubic yards or fraction thereof
200,001 cubic yards or more	\$170 for the first 200,000 cubic yards plus \$3 for each additional 10,000 cubic yards or fraction thereof
Other Fees	
Additional plan checking necessitated by changes, additions or revisions to submitted or approved plans	\$50 per 1 hour (minimum charge one-half hour)
The plan-checking fee for a grading permit authorizing additional work to that specified under a valid permit shall be the difference between such fee paid for the original permit and the fee shown for the entire project	

Sedona - Land Development Code

**TABLE 808.02:
GRADING PERMIT FEE SCHEDULE**

25 cubic yards or less	\$10
26 to 100 cubic yards	\$15
101 to 1000 cubic yards	\$15 for the first 100 cubic yards, plus \$6 for each additional 100 cubic yards, or fraction thereof
1001 to 10,000 cubic yards	\$78 for the first 1,000 cubic yards plus \$6 for each additional 1,000 cubic yards or fraction thereof
10,0001 to 100,000 cubic yards	\$132 for the first 10,000 cubic yards plus \$27 for each additional 10,000 cubic yards or fraction thereof
100,001 cubic yards or more	\$375 for the first 100,000 cubic yards plus \$25 for each additional 10,000 yards or fraction thereof
The fee for a grading permit authorizing additional work to that specified under a valid permit shall be the difference between the fee paid for the original permit and the fee shown for the entire project	

Grading and Drainage

§ 809 BONDS.

809.01 Bonds Required. A permit shall not be issued for more than 5,000 cubic yards of grading or lesser amounts of grading if specified by the City Engineer unless the permittee shall first post with the Director a cash bond or a bond executed by the owner and a corporate surety authorized to do business in Arizona as a surety in an amount sufficient to cover the cost of the project, including corrective work necessary to remove and eliminate geological hazards, all as determined by the City Engineer.

809.02 Conditions. Every bond shall include the conditions that the permittee shall:

A. Comply with all of the provisions of this article, applicable laws and ordinances;

B. Comply with all of the terms and conditions of the permit for excavation or fill to the satisfaction of the City Engineer and the Director;

C. Complete all of the work contemplated under the permit within the time limit specified in the permit or in § 806. If the Director extends the time specified in the permit, no such extension shall release the surety upon the bond.

809.03 Failure to Complete Work. The term of each bond shall begin upon the date of filing and shall remain in effect until the completion of the work to the satisfaction of the City Engineer and the Director. In the event of failure to complete the work and failure to comply with all of the conditions and terms of the permit, the City Engineer may order the work required by the permit to be completed to his satisfaction. The surety executing such bond or deposit shall continue to be firmly bound under a continuing obligation for the payment of all necessary costs and expenses that may be incurred or expended by the governing agency in causing any and all such required work to be done. In the case of a cash deposit, said deposit or any unused portion thereof shall be refunded to the permittee.

809.04 Assurance of Construction Through Loan Commitment. In lieu of providing assurance of construction in the manner provided above in this section, the permittee may provide assurance of construction for grading improvements by delivering to the City Engineer, prior to the issuance of a permit, an appropriate agreement between an approved lending institution and the permittee, stating that funds sufficient to cover the entire cost of performing the proposed work, including engineering and

inspection costs, in an amount approved by the City Engineer, have been deposited with such approved lending institution, or have been committed to be loaned by such lending institution to the permittee. Such agreement shall provide that such funds in the stated amount are specifically allocated and will be used by the permittee, or on his behalf, only for the purpose of performing the grading improvements. The city shall be the beneficiary of such agreement or the permittee's rights thereunder shall be assigned to the city, and the City Engineer shall approve each disbursement of any such funds. The agreement may also contain terms, conditions and provisions normally included by such lending institutions in loan commitments for construction funds, or as may be necessary to comply with statutes, codes and rules applicable to such lending institutions. In the event a bond or approved assurance for the proposed work is provided through some other ordinance or stipulation, a second assurance to fulfill this article shall not be required.

(Am. Ord. 2009-15, passed 10-13-2009)

Sedona - Land Development Code

§ 810 GRADING, INSPECTION, CUTS, FILLS AND SUPERVISION.

810.01 General. All grading operations for which a grading permit is required shall be subject to inspection by the Director and the City Engineer. When required by the City Engineer, special inspection of grading operations and special testing shall be performed in accordance with the provisions of this section.

810.02 Grading Designation. Engineered grading and regular grading as defined in Article 2 shall apply to this section.

810.03 Engineered Grading Requirements.

A. For engineered grading, it shall be the responsibility of the Civil Engineer who has prepared the approved grading plan to incorporate all recommendations from the soil engineering report and engineering geology report into the grading plan. This engineer shall also be responsible for the professional inspection and certification of the grading within his area of technical specialty. This responsibility shall include, but need not be limited to, inspection and certification as to the establishment of line, grade and drainage of the development area.

B. The Civil Engineer shall act as the coordinating agent in the event the need arises for liaison between other professionals, the contractor, the Director and the City Engineer. The Civil Engineer shall also be responsible for the preparation of revised plans and the submission to the City Engineer of as-graded grading plans upon completion of the work.

C. Soil engineering and engineering geology reports shall be required as specified in § 805. During grading, all engineering geology recommendations shall be submitted to the Civil Engineer and to the City Engineer by the Soil Engineer and the engineering geologist.

D. The Soil Engineer's area of responsibility shall include, but need not be limited to, the professional inspection and certification concerning the preparation of ground to receive fills, testing for required compaction, stability of all finish slopes and the design of buttress fills, as required, incorporating data supplied by the engineering geologist.

E. The engineering geologist's area of responsibility shall include, but need not be limited to, professional inspection and certification of the adequacy of

natural ground for receiving fills and the stability of cut slopes with respect to geological matters, and the need for sub-drains or other ground water drainage devices. The engineering geologist shall report all findings to the Soil Engineer and the Civil Engineer for engineering analyses.

F. The City Engineer shall inspect the project at the various stages of the work requiring certification and at any more frequent intervals, as he determines to be necessary, to assure that adequate control is being exercised by the professional consultants.

810.04 Regular Grading Requirements. The City Engineer may inspect the work and may require adequate inspection and compaction control by an approved soils testing agency. The testing agency's responsibility shall include, but need not be limited to, certification concerning the inspection of cleared areas and benches to receive fill, and the compaction of fills. When the City Engineer has cause to believe that geologic factors may be involved, the grading operation shall be required to conform to engineered grading requirements.

810.05 Notification of Noncompliance. If, in the course of fulfilling their responsibilities under this article, the Civil Engineer, the Soil Engineer, the engineering geologist, or the testing agency finds that the work is not being performed in conformance with this article or with the plans approved by the City Engineer, the discrepancies shall be reported in writing immediately to the Director and to the City Engineer, and they shall stop-order all work until corrective measures are completed. Recommendations for corrective measures, if deemed necessary by the City Engineer, shall be submitted.

810.06 Transfer of Responsibility for Certification. If the Civil Engineer, the Soil Engineer, the engineering geologist, or the testing agency of record are changed or replaced during the course of the work, the work shall be stopped fully until the replacement has agreed in writing to accept the responsibility, within the area of their technical competence, for certification upon completion of the work.

810.07 Cuts.

A. **General.** On all lots or parcels, development, design and construction techniques should blend scale, form and visual character into the natural land forms, and minimize exposed scars. Cuts shall conform to the provisions of this section. Removal of trees in conjunction with cuts shall conform with the provisions of § 910.07.

Grading and Drainage

B. Substructure protection. The permittee shall determine any utilities or other substructures that exist in the location to be excavated no less than 2 working days prior to the commencement of any work by calling the Blue Stake Center; the 800 number may be utilized. Excavation shall be undertaken with sufficient care not to interrupt the utility service function or to disturb the utility or other substructure physical supports.

C. Drainage design and treatment. Any alterations to existing natural drainage systems shall meet requirements pursuant to § 805.06.

D. Safety. Cuts shall be adequately fenced to preclude unauthorized access, as determined by the Director.

E. Natural contours. All buildings, structures, driveways and roads shall, to the greatest extent practicable, utilize the natural contours of the land so as to minimize disturbed area.

F. Revegetation. Cut slopes shall be seeded or otherwise vegetated within 1 month of completion or as soon as the planting season allows as determined by the Director. Re-vegetation of cut slopes shall include a mix of plant types indigenous to the area and similar to surrounding plant life, with size and species to provide for variation in color, texture and mass. This may range from trees to low wildflower groundcovers. Irrigation and maintenance adequate for the survival of the plant species, as determined by the Director, shall be provided until mature enough to survive without programmed care by the legal owners of the cut slope. For cuts greater than 5,000 cubic yards, the revegetation plan shall be submitted by a Landscape Architect.

G. Slope face. Construction shall avoid creating a smooth face on cut slopes and shall leave small rock outcrops and boulders where possible. Such natural features shall be retained to add interest and stability to the cut slope.

H. Blending. Cut slopes shall be blended into the natural terrain by rounding the tops, bottoms and lateral faces of the slopes. The radius of rounding shall be equal to one-half the distance between the toe and top of cut slope as measured along the slope face.

I. Cut slopes. Cut and fill slopes shall meet the following requirements:

1. The slope shall be finished and revegetated with natural rock and plant material in quantities

consistent with the area and in a manner that substantially reduces the potential for erosion;

2. The vertical height of the cut shall not exceed 8 feet and when used together with a fill slope (see § 810.08I.) shall not exceed 16 feet in total height;

3. The slope of a cut surface shall be no steeper than is safe for intended use, as determined by the City Engineer. It shall be no steeper than 2 horizontal to 1 vertical unless the owner provides a Soil Engineering or an engineering geology report, or both, stating that the site has been investigated and stating that a cut at a steeper slope will remain stable and not create a hazard to life or property;

4. No slope shall be considered stable by the City Engineer if rill erosion may result;

5. All slopes 1-1/2 horizontal to 1 vertical or flatter, and all slopes able to be re-vegetated as specified in the soil engineering or engineering geology report, or both, shall be fully revegetated in accordance with § 810.07F. of this article;

6. Concrete and masonry decorative walls, and retaining walls used in association with cut slopes shall be color treated or veneered to blend in with the surrounding natural colors of the native rock and soils at the site. The surfaces shall be rough textured with heavy shadow patterns.

J. Driveways.

1. The maximum height of any cut used to establish a driveway shall not exceed 8 feet. Overall heights may exceed 8'-0" where justified by topographic conditions. In these cases an overall maximum height of 14 feet may be achieved by use of more than 1 cut provided that a minimum planting area of 5'-0" is constructed between the 2 cuts.

2. In Hillside Development Areas, where justified by topographic conditions, the maximum slope of a driveway may exceed 15%, provided that minimum standards for break-overs are maintained, as determined and applied by the City Engineer based on ITE Guidelines for Driveway Location and Design (ITE Publication No. RP-006B). Driveways shall conform as closely as possible to natural topography, but no portion shall exceed 24%.

K. Slopes greater than 30%. For slopes greater than 30% that are determined to be unstable in the soil and geology report submitted in accordance with

the requirements of § 805, construction shall only be permitted

Sedona - Land Development Code

if an engineering solution acceptable to the City Engineer is found.

L. Exceptions for improved properties. Improvements to existing streets or highways, or improvements to existing cut slopes, which do not conform with this article, may be excepted. Any exception shall be authorized by the City Engineer.

810.08 Fills.

A. General. On all lots or parcels, development, design and construction techniques should blend scale, form and visual character into the natural land forms, and minimize exposed scars. Fills shall conform to the provisions of this section. In the absence of an approved Soil Engineering report, these provisions may be waived by the City Engineer for minor fills not intended to support structures.

B. Fill location. Fill slopes shall not be constructed on natural slopes steeper than 2 to 1.

C. Preparation of ground. The ground surface shall be cleared and grubbed to receive fill by removing vegetation, roots 1-1/2 inches in diameter and larger, non-complying fill, topsoil and other unsuitable materials; by scarifying to provide a bond with the new fill and, where the slope is steeper than 5 to 1 and the height is greater than 5 feet, by benching into sound bedrock or other competent material. This shall be determined by the soil engineering or engineering geology report or both. The bench under the toe of a fill, on a slope steeper than 5 to 1 shall be no less than 10 feet wide. The area beyond the toe of fill shall be sloped for sheet over-flow or a paved drain shall be provided. When fill is to be placed over a cut, the bench under the toe of fill shall be no less than 10 feet wide. The cut shall be made before placing the fill and accepted as a suitable foundation for the fill by a soil engineer or engineering geologist, or both.

D. Fill material; exception.

1. Organic materials shall not be authorized. No rock or similar irreducible material with a maximum dimension greater than 8 inches in maximum dimension shall be buried or placed in fills.

2. Rocks greater than 8 inches in maximum dimension may be authorized by the City Engineer only when a soil engineer devises a proper method

of placement, continuously inspects their placement and approves the fill stability. When so authorized, the following 3 conditions shall also apply:

a. Prior to issuance of the grading permit, potential rock disposal areas shall be delineated in the grading plan;

b. Rock sizes greater than 8 inches in maximum dimension shall be no less than 10 feet below grade as measured vertically;

c. Rocks shall be placed so as to fill all voids with fines.

E. Layering and rock use and reuse.

1. Fill material shall be placed in horizontal layers at depth compatible with the material being placed and with the types of compaction equipment being used, as specified by the soil engineering or engineering geology report or both.

2. Each layer shall be spread evenly and moistened or aerated. Each layer spread for compaction shall not exceed 8 inches of compacted thickness unless excepted by the City Engineer as specified by § 810.08D.2. End-dumping or pushing of fill material over banks shall not be authorized.

3. The top surface of each fill layer shall have a crown or crossfall or not less than 1-in-50 but not greater than 1-in-20, at all times during construction.

4. Rocks excavated under grading permit from sites within the city may be used as fill under grading permit at other sites and shall be placed in accordance with the provisions of § 810.08.

5. If such rocks are used under grading permit and there is insufficient fine material to fill the interstices between particles, such fractured rock may be used when specified in a soil engineering or engineering geology report or both only under the following conditions:

a. It shall be spread uniformly on a previously compacted lift;

b. It shall be covered with a sufficient amount of fine earth materials;

c. It shall be scarified or drift-bladed to mix the loose materials;

Grading and Drainage

d. It shall be compacted to the required density, as required in § 810.08F, utilizing a tamper foot or vibrating roller.

6. All rock for fill shall be reduced to a size of 4 inches in maximum dimension or less when taken from an excavation borrow within or without the city where a volume greater than 5,000 cubic yards of fractured rock will be produced. The reduction shall be performed by a rock crusher. The processing of such rock from an excavation shall occur at the borrow pit.

F. Compaction. All fills shall be compacted to a minimum of 95% under, and within 5 feet of structures, and within traffic areas. For all other areas, compaction shall be to a minimum of 90% of maximum density as determined by UBC Standard No. 70-1. In-place density shall be determined in accordance with UBC Standard No. 70-2, 70-3, 70-4, or 70-5. For engineered grading, the frequency of in-place density testing shall be a minimum of 1 per each 5,000 square feet or a total of 3 per lift, per site, whichever is greater.

G. Slope. The slope of fill surfaces shall be no steeper than is safe for the intended use. In no cases shall fill slopes be steeper than 2 horizontal to 1 vertical. Slopes shall be designed to blend with the natural terrain. Slopes shall be rounded at tops and bottoms and laterally to blend with natural contour configurations. Drainage resulting from such blending shall conform with § 805.06 of this article.

H. Drainage and terracing. Drainage and terracing shall be provided. The area above fill slopes and the surfaces of terraces shall be graded as required by § 805.06 of this article.

I. Fill height. No fill shall be greater than 8 feet in vertical height, as measured vertically from the toe to the top of the fill slope. The total height of a cut and fill slope shall not exceed 16 feet total. A decorative retaining wall designed to retain pre-fill native vegetation, as delineated in § 810.07I, shall be provided, when incorporation into the fill design will result in significant retainage of the pre-fill native vegetation as determined by the Director. The design of the decorative retaining wall shall be from among those on the list of wall designs authorized by both the City Engineer and the Director.

J. Re-vegetation. All fill slopes and surfaces shall be fully re-vegetated in accordance with § 810.07F, of this article.

K. Exceptions for improved properties. Improvements to existing streets or highways, or improvements to existing fill slopes, which do not conform with this article, may be excepted. Any exception shall be authorized in writing by the City Engineer.

L. Blending. Fill slopes shall be blended into the natural terrain by rounding the tops and bottoms of the slopes. The radius of rounding shall be equal to one-half the distance between the top and top of fill slope as measured along the slope face.

M. Walls. Concrete and masonry decorative walls and retaining walls used in association with fill slopes shall be color treated or veneered to blend in with the surrounding natural colors of the native rock and soils at the site. The surfaces shall be rough textured with heavy shadow patterns.

810.09 Setbacks.

A. General. Cut and fill slopes shall be set back from site boundaries in accordance with this section. Setback dimensions shall be horizontal distances measured perpendicular to the site boundary.

B. Top of cut slope. The top of cut slopes shall be made not nearer to a site boundary line than one-fifth of the vertical height of cut with a minimum of 2 feet and a maximum of 10 feet. The setback may need to be increased for any required interceptor drains.

C. Toe of fill slope. The toe of fill slope shall be made not nearer to the site boundary line than one-half the height of the slope with a minimum of 2 feet and a maximum of 20 feet. Where a fill slope is to be located near the site boundary and the adjacent off-site property is developed, special precautions shall be incorporated into the work as the City Engineer deems necessary to protect the adjoining property from damage as a result of such grading. These precautions may include, but are not limited to:

1. Additional setbacks;
2. Provision for retaining or slough walls;
3. Mechanical or chemical treatment of the fill slope surface to minimize erosion;
4. Provisions for the control of surface waters.

Sedona - Land Development Code

D. Modification of slope location.

The City Engineer may approve alternate setbacks. The City Engineer may require an investigation and recommendation by a civil engineer or engineering geologist to demonstrate that the intent of this section has been satisfied.

(Am. Ord. 2006-02, passed 1-10-2006)

Grading and Drainage

§ 811 SAFETY PRECAUTIONS.

811.01 If at any stage of the work the City Engineer determines by inspection that further grading as authorized will endanger any property or result in the depositing of debris on any public way or interfere with any existing drainage course, the City Engineer shall require, as a condition to allowing the work to be completed, that such reasonable safety precautions be taken as he considers advisable to avoid such likelihood of damage.

811.02 Notice to comply shall be submitted to the permittee and owner in writing by the City Engineer. After a notice to comply is written, a period of 10 days shall be allowed for the contractor to begin to make the corrections unless an imminent hazard exists, in which case the corrective work shall begin immediately.

811.03 If the City Engineer finds any existing conditions not as stated in the grading permit or approved plans, he may refuse to approve further work until approval is obtained for a revised grading plan which will conform to the existing conditions.

811.04 The City Engineer may specify methods of dust control, including but not limited to mechanical and vacuum sweeping, and flushing of road surfaces.

811.05 All drainage facilities impacted by site runoff or flushing activities shall be cleaned of accumulated debris, soil and rock.

811.06 The City Engineer may specify temporary erosion control measures, including but not limited to silt fences and keyed straw bales.

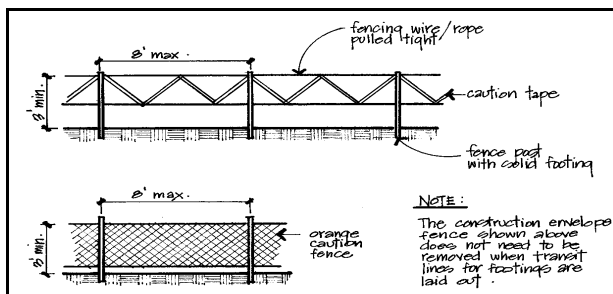
§ 812 RESPONSIBILITY OF PERMITTEE.

812.01 Compliance with Plans and Requirements. All permits issued hereunder shall be presumed to include the provision that the applicant, his agent, contractor or employees shall carry out the proposed work in accordance with the approved plans and specifications and in compliance with all the requirements of this article.

812.02 Protection of Utilities. During the grading operations, the permittee shall be responsible for the prevention of damage to any street or drainage facilities or to any public utilities or services. This responsibility applies within the limits of grading and along any routes of travel of equipment.

812.03 Protection of Adjacent Property. The permittee is responsible for the prevention of damage to adjacent property, and no person shall excavate on land sufficiently close to the property line to endanger any adjoining public street, sidewalk, alley or other public or private property prior to supporting and protecting such property from settling, cracking or other damage which might result.

812.04 Construction Envelope. Prior to the issuance of a building permit, and during construction activities, the construction envelope shall be clearly designated on the property by a fence a minimum of 3 feet high and staked at 8 feet on center to protect all natural vegetation outside of the construction envelope. See illustration below.



812.05 Surplus Material. All surplus excavated material shall be removed from the lot or parcel.

Grading and Drainage

§ 813 MODIFICATION OF APPROVED PLANS.

No modification of the approved grading plans may be made without the approval of the City Engineer. All necessary revisions to soils and geological reports shall be submitted with the revised plans.

Sedona - Land Development Code

§ 814 COMPLETION OF WORK.

814.01 Final Reports. Upon completion of the rough grading work, and at the final completion of the work, the City Engineer or the Director, or both may require the following reports, drawings and supplements thereto covering the following subjects:

A. An as-graded grading plan prepared by the Civil Engineer, including original ground surface elevations, as-graded ground surface elevations, lot and parcel drainage patterns, and locations and elevations of all surface and subsurface drainage facilities. The Civil Engineer shall provide certification that the work was accomplished in accordance with the approved final grading plan;

B. When required by § 805, a soil engineering report prepared by the soil engineer, including locations and elevations of field density tests, summaries of field and laboratory tests, and other substantiating data and comments on any changes made during grading and their effect on the recommendations made in the soil engineering investigative report. The soil engineer shall provide certification as to the adequacy of the site for the intended use;

C. When required by § 805, an engineering geology report prepared by the engineering geologist, including a final description of the geology of the site, any new information disclosed during the grading, and the effect of these facts on the recommendations incorporated in the approved grading plan. The engineering geologist shall provide certification as to the adequacy of the site for the intended use as affected by geological factors.

814.02 Notification of Completion. The permittee or his agent shall notify the City Engineer when the grading operation is ready for final inspection. Final approval shall not be given until all work, including installation of all drainage facilities and their protective devices and all erosion control measures, have been completed and the final reports have been submitted and accepted by the City Engineer.